

CLAIM:

1. A method of wavelet filtering a digital image, the digital image comprising a plurality of pixels arranged in one or more bands of pixels, the method performing the following steps for each one of said one or more bands of said pixels:

retrieving a plurality of previous partial results from a first or second storage;

inputting a current group of adjacent said pixels;

computing coefficients utilising said current group of adjacent pixels and said plurality of previous partial results;

outputting said coefficients; and

storing a plurality of current partial results in said first storage if said current group is not the last group in the band, in said second storage if said group is the last group in the band.

2. A method as claimed in claim 1, wherein said first storage is a local storage.

3. A method as claimed in claim 1 or 2, wherein said second storage is a remote storage.

4. A method as claimed in claim 1, wherein said digital image is an original image and said wavelet filtering performs a forward wavelet transform.

5. A method as claimed in claim 1, wherein said digital image is a sub-band of an original image and said pixels are coefficients and said wavelet filtering performs a forward wavelet transform.

6. A method as claimed in claim 1, wherein said digital image is one or more associated sub-bands of an original image, and said pixels are coefficients and said wavelet filtering performs an inverse wavelet transform.

7. A method as claimed in claim 1, wherein said method further comprises:
repeating said retrieving, inputting, computing, outputting, and storing steps in sequence a plurality of times.

8. A method as claimed in claim 4 or 5, wherein said computing step is calculated in accordance with a 5/3 forward wavelet transform.

9. A method as claimed in claim 4, wherein said computing step is calculated in accordance with a 5/3 inverse wavelet transform.

10. A method as claimed in claim 2 or 3, wherein said computing step is calculated in accordance with a 9/7 forward wavelet transform.

11. A method as claimed in claim 4, wherein said computing step is calculated in accordance with a 9/7 inverse wavelet transform.

12. A method as claimed in claim 2, wherein said plurality of partial results stored in said local storage comprises a pixel and a coefficient.

13. A method as claimed in claim 2, wherein said plurality of partial results stored in said local storage comprises a pixel, intermediate values, and a coefficient.

14. Apparatus for wavelet filtering a digital image, the digital image comprising a plurality of pixels arranged in one or more bands of pixels, the apparatus comprising:

means for retrieving, for each one of said one or more bands of pixels, a plurality of previous partial results from a first or second storage;

means for inputting, for each one of said one or more bands of pixels, a current group of adjacent said pixels;

means for computing coefficients, for each one of said one or more bands of pixels, utilising said current group of adjacent pixels and said plurality of previous partial results;

means for outputting, for each one of said one or more bands of pixels, said coefficients; and

means for storing a plurality of current partial results in said first storage if said current group is not the last group in the band, in said second storage if said group is the last group in the band.

15. Apparatus as claimed in claim 14, wherein said first storage is a local storage.

16. Apparatus as claimed in claim 14 or 15, wherein said second storage is a remote storage.

17. A computer readable medium comprising a computer program for wavelet filtering a digital image, the digital image comprising a plurality of pixels arranged in one or more bands of pixels, the computer program comprising:

code for retrieving, for each one of said one or more bands of pixels, a plurality of previous partial results from a first or second storage;

code for inputting, for each one of said one or more bands of pixels, a current group of adjacent said pixels;

code for computing coefficients, for each one of said one or more bands of pixels, utilising said current group of adjacent pixels and said plurality of previous partial results;

code for outputting, for each one of said one or more bands of pixels, said coefficients; and

code for storing a plurality of current partial results in said first storage if said current group is not the last group in the band, in said second storage if said group is the last group in the band.

18. A computer readable medium as claimed in claim 17, wherein said first storage is a local storage.

19. A computer readable medium as claimed in claim 17 or 18, wherein said second storage is a remote storage.

20. A wavelet filter for wavelet filtering a digital image, the digital image comprising a plurality of pixels arranged in one or more bands of pixels, the filter comprising:

a first storage for storing a plurality of previous partial results;

a second storage for storing a plurality of previous partial results;

a controller for selecting the plurality of previous partial results from said first or second storage;

a pixel input mechanism for inputting a current group of adjacent said pixels;

a lifting lattice of multiplier and adder units for computing coefficients utilising said current group of adjacent pixels and said selected plurality of previous partial results; output means for outputting said coefficients; and

a controller for storing a plurality of current partial results in said first storage if said current group is not the last group in the band, in said second storage if said group is the last group in the band.

21. A wavelet filter as claimed in claim 20, wherein said first storage is a local storage.

22. A wavelet filter as claimed in claim 20 or 21, wherein said second storage is a remote storage.

23. A wavelet filter as claimed in claim 20, wherein said pixel input means comprises a plurality of multiplexers for selecting in turn a group of pixels as said current group.

24. A wavelet filter as claimed in claim 20, wherein said digital image is an original image and said wavelet filtering performs a forward wavelet transform.

25. A wavelet filter as claimed in claim 20, wherein said digital image is a sub-band of an original image and said pixels are coefficients and said wavelet filtering performs a forward wavelet transform

26. A wavelet filter as claimed in claim 20, wherein said digital image is one or more associated sub-bands of an original image, and said pixels are coefficients and said wavelet filtering performs an inverse wavelet.

27. A wavelet filter substantially as described herein with reference to the accompanying drawings.

28. A method of wavelet filtering, the method substantially as described herein with reference to the accompanying drawings.

29. A computer readable medium comprising a computer program, the computer program substantially as described herein with reference to the accompanying drawings.

DATED this Fourteenth Day of March, 2001

Canon Kabushiki Kaisha

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